

Clinical variation: Hysterectomy

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A priority for the ACI is identifying unwarranted variation in clinical practice and working in partnership with healthcare providers to develop mechanisms to improve clinical practice and patient care.

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Glossary

ACHI	Australasian College of Health Informatics
ACI	Agency for Clinical Innovation
ACSQHC	Australian Commission on Safety and Quality in Health Care
ALOS	Average Length of Stay
CI	Cancer Institute
CMEE	Clinical Monitoring, Economics and Evaluation
HoPeD	Hospital Performance Dataset
IUD	Intrauterine device
LHD	Local Health District
OECD	Organisation for Economic Co-operation and Development
UCV	Unwarranted Clinical Variation
UCVT	Unwarranted Clinical Variation Taskforce

Executive summary

In Australia rates of hysterectomy are relatively high compared with international counterparts. In NSW, there are over 8000 hysterectomies performed each year. In 2016-17, about 24% of cases were for heavy menstrual bleeding, 20% for prolapse, 18% for fibroids, and 13% for cancer.^a

There are four main surgical approaches. Among non-cancer hysterectomies in 2016-17, the most common approach was abdominal (32%), followed by vaginal (25%), laparoscopic (22%), and lapa-vaginal (21%) surgery. The average length of stay (ALOS) was longest for abdominal (3.8 days) and shortest for laparoscopic hysterectomies (2.5 days).

The proportion of procedures performed laparoscopically has increased in recent years (from 8% in 2008-09 to 22% in 2016-17); conversely, the proportion performed abdominally has decreased from 42% in 2008-09 to 32% in 2016-17.

There is modest variation across local health districts in the rate (per 100,000 women) of hysterectomies for cancer (from 24.3 per 100,000 in Murrumbidgee to 40.4 per 100,000 in South Eastern Sydney)^b – however there is marked variation in the rate for heavy menstrual bleeding from 22.3 per 100,000 in Sydney to 170.8 per 100,000 in Western NSW.

The types of procedures used for heavy menstrual bleeding hysterectomies differ across hospitals, with abdominal approaches used for 10% of cases in Lismore and 85% in Bankstown-Lidcombe in 2015-16 and 2016-17. At the same period of time, ALOS for hysterectomies for heavy menstrual bleeding ranged from 2.0 at Orange Base Hospital to 3.6 at Fairfield Hospital.

A clinical reference group was convened, who reviewed data from various NSW hospitals and provided input on current practice. From their clinical expertise they identified variation in treatment of heavy menstrual bleeding. They noted a trend in de-skilling vaginal procedures and alternatively up-skilling in laparoscopies resulting in more lap surgeries being performed. It should be noted that new evidence indicates benefits to patient safety in moving towards vaginal instead of lapa-hysterectomies by notable reductions of area damage and bleeding (Cochrane, 2019). This may be further justified to avoid the high costs of laparoscopy disposables.

Further assessment of these differences in care decision-making, procedures and outcomes is required to evaluate the degree to which variation is warranted, to identify key principles of care for hysterectomy and minimise unwarranted variation in clinical practice.

^a*other reasons include endometriosis of the uterus, benign neoplasm of ovary, endometrial glandular hyperplasia, postmenopausal bleeding, and dysmenorrhoea, unspecified

^b** Northern NSW has very low rates – possibly because women go to Queensland hospitals for cancer surgery.

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Introduction

The Agency for Clinical Innovation's (ACI) Unwarranted Clinical Variation Taskforce (UCVT) defined Unwarranted Clinical Variation (UCV) as 'Patient care that differs in ways that are not a direct and proportionate response to available evidence; or to the healthcare needs and informed choices of patients' (Sutherland and Levesque, 2019).

In 2016, UCVT identified potential variation in hysterectomy undertaken for cancer-related and non-cancer related diagnoses in NSW.

Variation in several components of the "hysterectomy clinical journey" has been identified at facility, local health district (LHD), state and national level including:

- the Organisation for Economic Co-operation and Development (OECD) Medical Practice Variation Study 2011-12 highlighted variation in the rate of intervention for hysterectomy, with Australia having a higher rate of surgical intervention than several other comparable OECD countries including New Zealand¹
- the Australian Commission on Safety and Quality in Health Care (ACSQHC) Australian Atlas of Variation reported the rate of hysterectomy for the Australian population noting that the rate was significantly higher in regional areas as compared to remote or inner city areas. The rate in NSW was slightly below the national average (272 vs 297 per 100000 population), but its range showed considerable variation (137 vs 527 or a 3.8 times rate of variation)²
- the Grattan Institute has shown a national clinical variance in removal of healthy ovaries during hysterectomy.³
- the ACI undertook a descriptive linked data analysis for NSW examining variation in the rate of intervention, length of stay, cost and type of intervention.

The above sample of analyses indicate that there are several layers to this variance at both the clinical and system levels, and also that further, more comprehensive analysis is warranted. The data regarding rates of intervention for hysterectomy provided a logical starting point to understand the status and "natural" clinical variance that exists, but no determination was made to whether this variance was unwarranted or justifiable.

Further assessment of these differences in care decision-making, procedures and outcomes was required to evaluate the degree to which variation is warranted, identify key principles of care for hysterectomy and minimise unwarranted variation in clinical practice.

The ACI Clinical Monitoring, Economics and Evaluation (CMEE) team (formerly Health Economics and Evaluation) reviewed data relating to non-cancer hysterectomy only and presented results to the Surgical Services Taskforce in October 2017, confirming the existence of variation in:

- patient outcomes, complications and length of stay in hospitals
- procedure volumes over time (within hospitals, between hospitals and between LHDs)

- surgical methods including open and abdominal, vaginal, laparoscopic and multi-modal procedures.

Cancer Institute (CI) NSW further investigated cancer-related hysterectomy data and presented findings back to the Gynaecological Oncology network in March 2018, confirming variation in length of stay between NSW hospitals and between hospitals with specialist gynaecological oncology services.

It was identified that further exploration of these results from a clinical context was warranted.

Purpose

This work intended to further assess the differences in care decision-making, procedures and outcomes, and evaluate the degree to which variation is warranted for non-cancer hysterectomies in NSW. This has been completed through the analysis of data and input of the Hysterectomy Clinical Reference Group, who have assessed clinical care relating to hysterectomy, underlying factors driving variation in care and best practice models for future service delivery to promote optimal health outcomes for women in NSW.

It is expected that this will lead to the identification of key principles of care for hysterectomy and to a reduction of unwarranted variation in clinical practice.

Method

A multifaceted approach was employed to meet the objectives of this work, including;

- a high level literature review to identify recognised standards of care in hysterectomy at a state, national and international level
- the establishment of a clinical reference group to provide subject matter expertise
- definition of best practice care principles for hysterectomy in NSW.

A high level review of existing guidelines, care standards and clinical recommendations for patients undergoing hysterectomy identified existing resources, and highlighted potential gaps in the availability of information and tools to support best practice.

A clinical reference group was established to provide comment and reflections on current clinical practices in NSW. The group included representation from regional and metropolitan health services, health consumers, general practice, public health, health economics, gynaecology and gynaecological oncology disciplines, as well as ACI project leads and sponsors.

A fact finding piece into variation of hysterectomies was commissioned by the ACI's UCVT. This involved a descriptive linked data analysis examining variation in the rate of intervention, length of stay, cost and type of intervention throughout NSW.

The Hysterectomy Clinical Reference Group considered the data from a clinical perspective to suggest appropriate next steps in addressing any problem areas. The group assessed clinical care relating to hysterectomy, underlying factors driving variation in care and best practice models for

future service delivery in order to promote optimal health outcomes for women in NSW. The group was asked to comment on current clinical practices in NSW public health facilities, including:

- the results of data analyses to date
- recommendations for additional analyses to be undertaken
- reflection on clinical practice and health system experiences
- identification of scope of clinical practices in metropolitan, regional and rural facilities (who currently undertake hysterectomy procedures in various health services)
- resources and tools to aid decision making
- referral and transfer pathways between service providers.

De-identified patient data between 2008-09-2016-17 were extracted from Hospital Performance Dataset (HoPeD), NSW Ministry of Health.⁴ Hysterectomies were identified using Australasian College of Health Informatics (ACHI) procedure codes while patients with heavy menstrual bleeding, cancers, prolapse and fibroids were identified by the principal diagnosis. Rates were standardised to the 2001 Australian population for comparison. Refer to Appendix A for ACHI procedure codes and descriptions used.

Results

A population-based record-linkage cohort study was undertaken, looking at patients who underwent a hysterectomy procedure admitted to NSW public hospitals for the period 2008-09 to June 2016-17.

Rates

It was noted that international comparisons show that rates of hysterectomy in Australia are relatively high. In NSW more than 8000 hysterectomies are performed each year. Numbers have decreased slightly over the past decade (from 8685 in 2008-09 to 8550 in 2016-17), with about 56.0% of hysterectomies performed in private hospitals in 2016-17.

In 2016-17, hysterectomies were performed for heavy menstrual bleeding (23.6% of cases), prolapse (19.8%), fibroids (17.9%), cancer (13.3%), and other reasons (25.4%), with 52.4% of these surgeries conducted in private hospitals.

For non-cancer hysterectomies, it was noted that in NSW there are more than 7000 non-cancer hysterectomies performed each year and numbers have decreased over the past decade (from 7740 in 2008-09 to 7393 in 2016-17). Cancer related hysterectomy data was not included in this piece of work as CI NSW is undertaking further investigation.

Age-standardised rates for non-cancer hysterectomies were 263.4 per 100,000 women in 2008-09 and this decreased to 225.2 per 100,000 women in 2016-17. The age-standardised rate for heavy

menstrual bleeding also decreased from 70.5 per 100,000 women in 2008-09 to 65.4 per 100,000 women in 2016-17.

Procedure approach

There are four main surgical approaches. In 2016-17, abdominal surgeries accounted for 35.1% of total hysterectomies, followed by vaginal (22.6%), laparoscopic (22.1%) and lapa-vaginal (19.9%).

Among non-cancer hysterectomies in 2016-17, the most common approach was abdominal (31.8%), followed by vaginal (25.4%), laparoscopic (21.5%), and lapa-vaginal (21.1%) surgery. The proportion of procedures for non-cancer patients performed laparoscopically has increased in recent years (from 7.7% in 2008-09 to 21.5% in 2016-17); conversely, the proportion performed abdominally has decreased (from 41.6% in 2008-09 to 31.8% in 2016-17).

The patterns of surgical approaches vary across indication. For example, in 2016-17 about half of hysterectomies for cancer (55.5%) or for fibroids (56.3%) were performed abdominally; while 77.3% of surgeries for prolapse were performed vaginally. More than one third of hysterectomies for heavy menstrual bleeding (35.6%) were performed abdominally.

Average length of stay^c

In 2016-17, ALOS* was longest for hysterectomies for cancer (5.6 days) and shortest for heavy menstrual bleeding (3.1 days).

ALOS* also varies by procedure type. Among hysterectomies for non-cancer reasons in 2016-17, ALOS* was 2.5 days for laparoscopic surgery, 2.7 days for lapa-vaginal, 3.1 days for vaginal and 3.8 days for abdominal surgery.

Variation

In 2016-17, there was modest variation across LHDs in the rate (per 100,000 women) of hysterectomies for cancer, ranging from 24.3 per 100,000 in Murrumbidgee LHD to 40.4 per 100,000 in South Eastern Sydney LHD. There is, however, marked variation in the rate of hysterectomies performed for management of heavy menstrual bleeding, ranging from 22.3 per 100,000 in Sydney LHD to 170.8 per 100,000 in Western NSW LHD.

In 2016-17, over half of all hysterectomies (52.7%) were performed on women aged 45-64 years; while 28.0% were performed on women aged 15-44 years; and 19.3% on women aged 65+ years. For the younger age group (women aged 15-44 years), heavy menstrual bleeding was the most frequent indication (42.0% of hysterectomies in that age group); and abdominal surgery was the most frequent procedure type (36.1%).

For women aged 45-64 years, fibroids were the second most common indication (23.6% of hysterectomies in this age group) with the most common indication being others (25.0%). Abdominal surgery was the most frequent procedure type (36.9%). Abdominal surgery

^c*note: LOS greater than 99% tile by cause were removed from ALOS analyses.

predominates in certain hospitals, with over 75% of non-cancer hysterectomies undertaken in Wagga Wagga, Coffs Harbour and Bankstown in 2016-17.

For women aged 65+ years, prolapse was the most common indication (46.9% of hysterectomies in this age group) and vaginal surgery the most frequent procedure (42.0%).

This age distribution is similar for hysterectomies among non-cancer patients, with 30.9%, 54.0% and 15.1% for women aged 15-44, 45-64 and 65+ years, respectively. While the most common procedure types for women aged 15-44 and 45-64 were abdominal (~35%), vaginal accounted for 60.0% of total hysterectomies among non-cancer patients who were 65 and over.

Complications

In 2016-17, about 8.0% of hysterectomies had a complication (identified by a condition onset flag); cancer patients had the highest rate (16.4%) and prolapse patients the lowest (5.2%).

Regardless of indication, abdominal surgery had higher complication rates compared with other surgical approaches.

Procedure volumes

In 2016-17, there were 99 patients who had hysterectomies in public hospitals that performed fewer than 10 cases in the year (18 hospitals); and 53 patients who had cancer hysterectomies in hospitals that performed fewer than 10 cases in the year (in 27 hospitals).

Heavy menstrual bleeding

It was noted that heavy menstrual bleeding is the indication where there is the greatest variation in hysterectomy rates across LHDs. In 2016-17, rates ranged from 22.3 per 100,000 women in Sydney LHD to 170.8 per 100,000 in Western NSW LHD.

The types of procedures used for heavy menstrual bleeding hysterectomies differ across hospitals. Between 2015-16 and 2016-17, abdominal approaches were used for 9.7% of cases in Lismore and for 85.3% in Bankstown-Lidcombe. Over the same period of time, ALOS for hysterectomies for heavy menstrual bleeding ranged from 2.0 at Orange Base Hospital to 3.6 at Fairfield Hospital.

Discussion

Among women undergoing non-cancer hysterectomy, vaginal hysterectomy has been associated with faster return to normal activities than abdominal and laparoscopic hysterectomy.⁵ Where feasible, it has been noted that vaginal hysterectomy should be performed in preference to abdominal hysterectomy due to more rapid recovery and fewer febrile episodes post-operatively.⁵ It has also been recognised that where vaginal hysterectomy is not possible, laparoscopic hysterectomy has some advantages over abdominal hysterectomy, including more rapid recovery, fewer febrile episodes and wound or abdominal wall infections.⁵

In order to gain greater insight into the factors influencing clinical variation and hysterectomy surgery, the Hysterectomy Clinical Reference Group was convened and included subject matter experts from research and clinical backgrounds. This group met several times to review results of data analyses and provide commentary and context to results.

While it was acknowledged that variation exists in hysterectomy in NSW in terms of procedural approach, indications for surgery and rates across districts, the Reference Group has been unable to confirm whether such variation is warranted or not.

In general, it is noted that there has been a shift in surgical practice from open procedures to laparoscopic due to advances in technology enabling less invasive procedures, as well as changes in surgical training, with more clinicians now skilled in performing procedures laparoscopically. It was, however, also noted that it is important to clarify that variation is not necessarily indicative of poor clinical practice.

Efforts to obtain primary care data to further complete the picture of the hysterectomy patient journey have been unsuccessful to date. As such, longitudinal general practice (GP) data is not currently available to inform further investigation into hysterectomy patient pathways prior to surgery.

It has been noted by the Hysterectomy Clinical Reference Group that further data is required to gain a complete picture as to whether the variation identified is warranted or unwarranted. In the absence of the primary care data, a number of recommendations to further progress this piece of work and understand the clinical variation associated with non-cancer hysterectomy are suggested below.

Recommendations

The Hysterectomy Clinical Reference Group has confirmed variation in non-cancer hysterectomy procedures in NSW, however, they have been unable to determine whether it is warranted or unwarranted.

There may be further investigation into the extent to which some aspects of variation are likely to be unwarranted, due to:

- clinician preference for procedure types
- limited resources available to assist patients in making informed choices about their condition prior to hysterectomy
- an unwillingness to explore conservative treatment options in some patient cohorts
- limited alternatives to surgery available in some regional and remote areas.

It is recommended that further investigation is undertaken to fully understand the context in which women are making decisions to proceed with hysterectomy to determine whether or not identified variation is warranted or unwarranted.

If this recommendation is agreed and approved, a second phase project would be required.

A recommendation has been put forward by the Clinical Reference Group to explore variation in hysterectomy for heavy menstrual bleeding on a geographical basis, to determine what underpins this variation. It has been suggested that this is done through both audit and the capturing of

vignettes. It was suggested that the ACI focuses on the outliers, by working with the LHDs that have the highest and lowest rates and exploring further.

Audit

- selecting five key elements to be extracted from the medical record (for example, primary surgery without trial of medical therapy and uterine size pre-surgery)
- in line with the clinical care standard
- a deliberate oversampling of Aboriginal women to get a more accurate interpretation of what is happening with this group.

Vignettes – ask providers about the core elements of the service they are delivering:

- describe the service
- service rationale
- types of procedures they do locally and why they do them that way
- their process when women first present
- local processes.

There is also the potential to look at the types of medical treatments available to women. For example, how available is Mirena intrauterine device (IUD) in different parts of NSW; did the medical intervention fail or was it not indicated for medical treatment; was the patient offered medical treatment. It was noted that Mirena IUD is on the Pharmaceutical Benefits Scheme, so data could be obtained by looking at rates per population within the primary health network (PHN). There may be a need to explore cross-LHD flows, looking at where women live and not just where they had their surgery.

A number of members from the Clinical Reference Group suggested that their medical students could be involved in this work for their projects.

Conclusion

In 2016, UCVT identified potential variation in hysterectomy undertaken for cancer related and non-cancer related diagnoses in NSW. Further assessment of the differences in care decision-making, procedures and outcomes was required to evaluate the degree to which variation is warranted, and to identify key principles of care for hysterectomy while minimising unwarranted variation in clinical practice.

While it was acknowledged that variation exists in hysterectomy in NSW in terms of procedural approach, indications for surgery and rates across districts, the Hysterectomy Clinical Reference Group was unable to confirm whether such variation is warranted or not.

Through the analysis of data and input of the Hysterectomy Clinical Reference Group, it has been identified that further exploration is needed to identify the extent to which some aspects of variation are likely to be unwarranted, and are potentially due to:

- clinician preference for procedure types
- limited resources available to assist patients in making informed choices about their condition prior to hysterectomy
- an unwillingness to explore conservative treatment options in some patient cohorts
- limited alternatives to surgery available in some regional and remote areas.

In order to confirm variation and encourage best practice models for future service delivery to promote optimal health outcomes for women in NSW, it is recommended that further exploration in variation in hysterectomy for heavy menstrual bleeding on a geographical basis is undertaken. It is recommended that this is done through both audit and the capturing of vignettes.

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Appendices

Appendix A: 2001 Australian Standardised Rates of Hysterectomy

ACHI Code	Block	ACHI code description	Abdominal	Laparoscopic	Laparoscopic vaginal	Vaginal
35653-00	1268	Subtotal abdominal hysterectomy	Y			
35653-01	1268	Total abdominal hysterectomy	Y			
35653-04	1268	Total abdominal hysterectomy with removal of adnexa	Y			
35657-00	1269	Vaginal hysterectomy				Y
35661-00	1268	Abdominal hysterectomy with extensive retroperitoneal dissection	Y			
35664-00	1268	Radical abdominal hysterectomy with radical excision of pelvic lymph nodes	Y			
35664-01	1269	Radical vaginal hysterectomy with radical excision of pelvic lymph nodes				Y
35667-00	1268	Radical abdominal hysterectomy	Y			
35667-01	1269	Radical vaginal hysterectomy				Y
35670-00	1268	Abdominal hysterectomy with radical excision of pelvic lymph nodes	Y			
35673-02	1269	Vaginal hysterectomy with removal of adnexa				Y
35750-00	1269	Laparoscopically assisted vaginal hysterectomy			Y	
35753-02	1269	Laparoscopically assisted vaginal hysterectomy with removal of adnexa			Y	
90448-00	1268	Subtotal laparoscopic abdominal hysterectomy		Y		
90448-01	1268	Total laparoscopic abdominal hysterectomy		Y		
90448-02	1268	Total laparoscopic abdominal hysterectomy with removal of adnexa		Y		

Cause of admission	Principal diagnosis ICD-10-AM
Cancer	"Cxx"
Heavy menstrual bleeding	N92, N93.8, N93.9
Prolapse	N81
Fibroid	D25